

REMARKS

Claims 1-18 are pending and are rejected. Claims 19-24 are added
Reconsideration and allowance of Claims 1-24 are respectfully requested.

Objections to Drawings

The drawings are objected to. In response thereto, Applicants submit a set of replacement (e.g., formal) drawings in compliance with 37 CFR 1.84, which are attached hereto under separate cover. No new matter is introduced.

Amendments to Specification

Applicants amend paragraph [0065] to correct a clerical error, and amend paragraph [0033] to include updated status information for a referenced U.S. Patent Application. No new matter is introduced.

Claim Rejections under 35 USC §102 over Blake

Claims 1, 3, and 15 are rejected under 35 USC §102(b) as being anticipated by Blake et al, "An Architecture for Differentiated Services," RFC 2475, December 1998, hereinafter referred to as Blake. Applicants respectfully traverse these rejections.

Independent Claim 1

Applicants' Claim 1 recites:

A traffic management processor for independently throttling the bandwidth of individual traffic flows, comprising:

an instruction decoder having an input to receive a throttle control instruction identifying a flow identification (ID) of a particular traffic flow to be throttled, and having an output to provide a throttle enable signal; and

a departure time calculator (DTC) circuit having an input to receive the throttle enable signal and configured to calculate a departure time for the incoming packet in response to size and bandwidth parameters associated with the incoming packet.

Blake fails to disclose or suggest a traffic management processor that independently throttles the bandwidth of individual traffic flows, as recited in Applicants' Claim 1.

Applicants' Claim 1 recites a traffic management processor that independently throttles the bandwidth of **individual** traffic flows. In contrast, Blake discloses a traffic routing architecture that processes **aggregated** traffic, NOT individual traffic flows. For example, Blake teaches "applying per-hop behaviors to aggregates of traffic which have been appropriately marked using the DS field in the [packet] headers."¹ Thus, for Blake's architecture, a packet's DS codepoint identifies a behavior aggregate or traffic type, NOT the particular traffic flow to which the packet belongs.² Thus, Blake provides that "per-application flow or per-customer forwarding state need not be maintained within the core of the network,"³ and therefore seems to teach away from the per-flow throttling technique recited in Applicants' Claim 1.

The Office Action states that Blake's traffic management processor includes "an instruction decoder (Classifier in Figure 1, page 16), having an input to receive a throttle control instruction identifying a flow identification ID (DS codepoint, 3rd bullet in page 3, or page 4) of a particular traffic flow to be throttled, and having an output (the output from Classifier to Meter in Figure 1, page 16) to provide a throttle enable signal." Applicants disagree.

The Office Action seems to equate Blake's "classifier" with the instruction decoder recited in Applicants' Claim 1. However, Blake's classifier is NOT an instruction decoder, does NOT have an input to receive a throttle control instruction, and does NOT have an output to generate a throttle enable signal, as suggested by the Office Action. Instead, Blake's classifier simply "steers the packets to a logical instance of a traffic conditioner."⁴ Indeed, Blake's Figure 1, to which the Office Action refers, clearly depicts the Classifier as having an input to receive packets, NOT an instruction. Further, there is no language in Blake that discloses that Blake's Classifier

1 See Blake, page 3, second paragraph.

2 See Blake, page 12, section 2, which provides: "Each behavior aggregate is identified by a single DS codepoint. Within the core of the network, packets are forwarded according to the per-hop behavior associated with the DS codepoint."

3 See Blake, page 3, second paragraph.

4 See Blake, page 15, section 2.3.3.

provides an enable signal, or that Blake's Classifier receives an instruction identifying a flow ID of a particular traffic flow to be throttled.

To anticipate a claim under 35 USC §102, each and every element of the claim must be disclosed in a single reference⁵. The exclusion of a claimed element from a prior art reference is typically enough to negate anticipation under 35 USC §102. Thus, because Blake fails to disclose or suggest a traffic management processor including "an instruction decoder having an input to receive a throttle control instruction identifying a flow identification (ID) of a particular traffic flow to be throttled, and having an output to provide a throttle enable signal," as recited in Applicants' Claim 1, Claim 1 is not anticipated by Blake. Accordingly, Applicants respectfully request the Office to withdraw the rejection of Claim 1.

Claims 2-5 depend from Claim 1 and therefore distinguish over the cited references for at least the same reasons as Claim 1.

Independent Claim 15

Applicants' Claim 15 recites:

A method for selectively throttling any number of traffic flows, comprising:
receiving an incoming packet including a flow identification (ID), the flow ID indicating to which traffic flow the incoming packet belongs;
receiving a throttle control instruction including a specified flow ID indicating which traffic flow is subject to throttling;
comparing the specified flow ID with the incoming packet's flow ID to generate a throttle enable signal; and
selectively delaying transmission of the incoming packet in response to the throttle enable signal.

Blake fails to disclose or suggest the method recited in Applicants' Claim 15.

The Office Action states that Blake discloses "receiving an incoming packet including a flow ID (DS codepoint in page 4), the flow ID indicating to which traffic flow the incoming packet belongs." Applicants disagree.

5 Corning Glass Works v. Sumitomo Electric, 9 USPQ2d 1962, 1965 (Fed. Cir. 1989).

The Office Action seems to equate Blake's "DS codepoint" with the flow ID recited in Applicants' Claim 15. However, while the flow ID recited in Applicants' Claim 15 indicates which traffic flow a corresponding packet belong to, Blake's DS codepoint is used to assign packets to a particular traffic type or behavior aggregate. Indeed, Blake specifically states that the DS codepoint is used to select a per-hop behavior (PHB),⁶ which is "the externally observable forwarding behavior applied at a DS-compliant node to a DS behavior aggregate."⁷ Thus, for Blake's architecture, a packet's DS codepoint identifies a behavior aggregate or traffic type, NOT the particular traffic flow to which the packet belongs.⁸ Accordingly, Blake fails to disclose or suggest "receiving an incoming packet including a flow identification (ID), the flow ID indicating to which traffic flow the incoming packet belongs," as recited in Applicants' Claim 15.

The Office Action further states that Blake discloses "receiving a throttle control instruction (the output of Marker in Figure 1, page 16) including a specified flow ID indicating which traffic flow is subject to throttling." However, in contrast to the Office Action's assertion, the output of Blake's Marker is NOT a throttle control instruction, as recited in Claim 15, but is rather a packet that has been marked and added to a particular traffic type or behavior aggregate. For example, Blake specifically provides that the Marker sets "the DS field of a packet to a particular codepoint, adding the marked packet to a particular DS behavior aggregate."⁹ Thus, Blake's Marker does NOT output a throttle control instruction, as suggested by the Office Action. Indeed, the Office Action has not pointed to any language in Blake that discloses "receiving a throttle control instruction including a specified flow ID indicating which traffic flow is subject to throttling," as recited in Applicants' Claim 15.

Accordingly, because Blake fails to disclose or suggest "receiving an incoming packet including a flow identification (ID), the flow ID indicating to which traffic flow the incoming packet belongs" and/or "receiving a throttle control instruction including a

6 See Blake, page 4 (definition of "DS codepoint").

7 See Blake, page 6 (definition of "PHB").

8 See Blake, page 12, section 2, which provides: "Each behavior aggregate is identified by a single DS codepoint. Within the core of the network, packets are forwarded according to the per-hop behavior associated with the DS codepoint."

9 Blake, page 16, paragraph 2.3.3.2.

specified flow ID indicating which traffic flow is subject to throttling,” as recited in Applicants’ Claim 15, Claim 15 is patentable over Blake.

Claims 16-18 depend from Claim 15 and therefore distinguish over the cited references for at least the same reasons as Claim 15.

Claim Rejections under 35 USC §102 over Heinanen

Claims 9-10 and 12-14 are rejected under 35 USC §102(b) as being anticipated by Heinanen et al “A Single Rate Three Color Marker,” RFC 2697, September 1999, hereinafter referred to as Heinanen. Applicants respectfully traverse these rejections.

Independent Claim 9

Applicants’ Claim 9 recites:

A method for selectively throttling individual traffic flows, comprising:

receiving an incoming packet including a bandwidth multiplier factor (BMF) and a flow identification (ID), the flow ID indicating to which traffic flow the incoming packet belongs;

receiving a throttle control instruction specifying which traffic flow is subject to throttling;

determining whether the incoming packet is part of the traffic flow specified by the throttle control instruction; and

selectively delaying transmission of the incoming packet in response to the determining.

Heinanen fails to disclose or suggest the method of Applicants’ Claim 9.

The Office Action states that Heinanen discloses “a method for selectively throttling individual traffic flows, comprising receiving an incoming packet including a BMF and a flow ID (DS field, second paragraph from the bottom of section 1, page 2), the flow ID (color of packet, second paragraph from the bottom of section 1, page 2) indicating to which traffic flow the incoming packet belongs” and “receiving a throttle control instruction field (Result, the Figure in page 2) specifying which traffic flow is subject to throttling.” Applicants disagree.

First, the Office Action seems to equate Heinanen's "color of packet" with the flow ID recited in Applicants' Claim 9. However, while the flow ID recited in Applicants' Claim 9 indicates which traffic flow the packet belongs to, Heinanen's "color of packet" indicates whether the packet is in compliance with a committed information rate, for example, in which "a packet is marked green if it doesn't exceed the [committed burst size] CBS, yellow if it does exceed the CBS, but not the [excess burst size] EBS, and red otherwise."¹⁰ Thus, in contrast to the Office Action's assertion, Heinanen's "color of packet" does NOT indicate which traffic flow the packet belongs to, and therefore Heinanen does NOT disclose or suggest a flow ID, as recited in Applicants' Claim 9.

Second, the Office Action seems to equate the "result" of Heinanen's Meter with the throttle control instruction recited in Applicants' Claim 9. However, while the throttle control instruction recited in Applicants' Claim 9 specifies which traffic flow is subject to throttling, Heinanen's "meter result" is used to color the packet, for example, depending upon whether the packet is less than the CBS, is between the CBS and the EBS, or exceeds the EBS. Thus, Heinanen's meter colors the packet for policing operations depending upon whether the packet is in compliance with the committed information rate (CIR); it is NOT an instruction and does NOT specify which traffic flows are subject to throttling. Accordingly, in contrast to the Office Action's assertion, Heinanen does NOT disclose or suggest "receiving a throttle control instruction specifying which traffic flow is subject to throttling, as recited in Applicants' Claim 9.

Further, in contrast to the Office Action's assertion, Heinanen's "color aware procedure" does NOT determine "whether the incoming packet is part of the traffic flow specified by the throttle control instruction," as recited in Applicants' Claim 9, but rather determines whether a packet is in compliance with the CIR (e.g., and is thus subject to policing for exceeding bandwidth limits).

Accordingly, because Heinanen does not disclose or suggest "receiving an incoming packet including a bandwidth multiplier factor (BMF) and a flow identification (ID), the flow ID indicating to which traffic flow the incoming packet belongs," "receiving a throttle control instruction specifying which traffic flow is subject to throttling," and/or "determining whether the incoming packet is part of the traffic flow specified by the

¹⁰ See Heinanen, first paragraph of section 1, page 1.

throttle control instruction,” as recited in Applicants’ Claim 9, Claim 9 is patentable over Heinanen.

Claims 10-14 depend from Claim 9 and therefore distinguish over the cited references for at least the same reasons as Claim 9.

Claim Rejections under 35 USC §103

Claims 2, 4-7, 11, and 16-18 are rejected under 35 USC §103(a) as being unpatentable over Blake in view of Heinanen. Applicants respectfully traverse these rejections.

Claims 2-5 depend from Claim 1 and therefore distinguish over the cited references for at least the same reasons as Claim 1.

Independent Claim 6

Applicants’ Claim 6 recites:

A traffic management processor for selectively throttling traffic flows to alleviate network congestion, comprising:

an instruction decoder for receiving a throttle control instruction that specifies which traffic flows are to be throttled, and having an output to provide a throttle enable signal; and

a departure time calculator (DTC) circuit for calculating a departure time for the incoming packet in response to size and bandwidth parameters associated with the incoming packet, the DTC circuit selectively multiplying the bandwidth parameter by a bandwidth multiplier factor (BMF) in response to the throttle enable signal when calculating the departure time.

None of cited references, whether taken alone or in combination, suggest the traffic management processor recited in Applicants’ Claim 6.

The Office Action states that Blake discloses a traffic management processor comprising “an instruction decoder (Classifier in Figure 1, page 16) for receiving a throttle control instruction that specifies which traffic flows are to be throttled, and having an output to provide a throttle enable signal (the output from Classifier to Meter

in Figure 1, page 15).” Applicants disagree.

The Office Action again seems to equate Blake’s “classifier” with the instruction decoder recited in Applicants’ Claim 1. However, Blake’s classifier is NOT an instruction decoder, does NOT have an input to receive a throttle control instruction, and does NOT have an output to generate a throttle enable signal. Instead, Blake’s classifier simply “steers the packets to a logical instance of a traffic conditioner.”¹¹ Indeed, Blake’s Figure 1, to which the Office Action refers, clearly depicts the Classifier as having an input to receive packets, NOT an instruction. Further, there is no language in Blake that discloses that Blake’s Classifier provides an enable signal, or that Blake’s Classifier receives an instruction specifying which traffic flows are to be throttled.

Further, the Office Action acknowledges that Blake fails to disclose a DTC circuit that calculates a departure time in response to size and bandwidth parameters associated with the incoming packet and a BMF, and states that Heinanen discloses “a way of metering (srTCM in Color-Aware mode, page 3) an incoming packet based on its size (packet of size B) and bandwidth parameters (Tc and Te, page 3, and CIR, CBS, and EBS, page 1),” and then concludes that “the departure time of outgoing packet is then adjusted according to the color of the packet [and] this is equivalent to multiplying a BMF in that the departure time of packet is adjusted.” Applicants disagree.

The metering portion of Heinanen on page 3 cited by the Office Action does NOT disclose a throttling technique to alleviate network congestion, but rather describes a well-known leaky bucket technique for policing incoming packets to ensure that the packets do not exceed negotiated bandwidth limits, for example, by either accepting or rejecting packets based on the size of the leaky bucket (e.g., the number of tokens available), and teaches using a color marking scheme to indicate whether to accept or reject the packets. For example, Heinanen specifically states that “a service may discard all red packets, because they exceeded both the committed and excess burst sizes, forward yellow packets as best effort, and forward green packets with a

11 See Blake, page 15, section 2.3.3.

low drop probability.”¹² Thus, Heinanen’s meter determines whether to accept or reject packets; it does NOT calculate a departure time and is NOT configured for “selectively multiplying the bandwidth parameter by a bandwidth multiplier factor (BMF) in response to the throttle enable signal when calculating the departure time,” as recited in Applicants’ Claim 6.

Accordingly, because none of the cited references disclose or suggest “a traffic management processor for selectively throttling traffic flows to alleviate network congestion,” or teach a traffic management processor including “an instruction decoder for receiving a throttle control instruction that specifies which traffic flows are to be throttled, and having an output to provide a throttle enable signal” and/or “a departure time calculator (DTC) circuit for calculating a departure time for the incoming packet in response to size and bandwidth parameters associated with the incoming packet, the DTC circuit selectively multiplying the bandwidth parameter by a bandwidth multiplier factor (BMF) in response to the throttle enable signal when calculating the departure time,” as recited in Applicants’ Claim 6, Claim 6 is patentable over the cited references.

Claims 7-8 depend from Claim 6 and therefore distinguish over the cited references for at least the same reasons as Claim 6.

Claims 11-14 depend from Claim 9 and therefore distinguish over the cited references for at least the same reasons as Claim 9.

Claims 16-18 depend from Claim 15 and therefore distinguish over the cited references for at least the same reasons as Claim 15.

New Claims 19-24

Claims 19-21 depend from Claim 1 and therefore distinguish over the cited references for at least the same reasons as Claim 1.

Claims 22-24 depend from Claim 6 and therefore distinguish over the cited references for at least the same reasons as Claim 6.

Support for the subject matter recited in new Claims 19 and 22 appears in original Claim 9.

¹² See Heinanen, section 5, page 4.

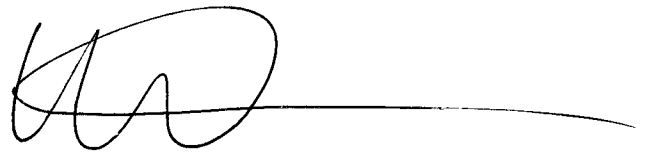
Support for the subject matter recited in new Claims 20-21 and 23-24 appears in the Applicants' specification at paragraphs [0082] and [0112] and in Figure 13.

CONCLUSION

In light of the above remarks, it is believed that Claims 1-24 are in condition for allowance and, therefore, a Notice of Allowance of 1-24 is respectfully requested. If the Examiner's next action is other than allowance as requested, the Examiner is requested to call the undersigned at (408) 236-6646.

3 April 2007
Dated

Respectfully submitted,

A handwritten signature in black ink, consisting of a stylized 'W' followed by a long horizontal line extending to the right.

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